Software and Analysis Group

Device/User Interface
Software Requirements
For
General Data Products
(GDP911)
Digital Matrix Switch

Version 1.0 (Revised)

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1.0 Introduction

This document provides device and user interface requirements for the General Data Products (GDP) 911 Digital 64 x 64 Matrix Switch.

2.0 Required Functionality

The GDP 911 is a 64 X 64 digital matrix switch. The three stages consist of input, central, and output. The switch' s role in the automated tracking station will be to route signals from inputs to outputs. The switch will be connected to and controlled by the Data Handling Node. It will be wired, via patch panels, to the input and output devices. The full capabilities of the device will be required by the automated tracking station.

3.0 Parameter Ranges

The parameter ranges will not differ from the device' s capabilities.

4.0 Communications Protocol

The switch communicates with the controlling computer using the RS-232C protocol. The switch will be directly connected to the controlling computer through the use of pipes and a serial cable.

5.0 GUI Functionality

The switch's role in the automated tracking station is to route signals from inputs to outputs. Any input can be routed to one or more outputs. It can also be used to route test data streams. Like all other automated devices, a pre-existing configuration file can be loaded or created, and saved. The configuration file is loaded automatically by ATS at initialization time. This switch GUI – like the MSC10693 analog device - is composed of three views and/or child frames: (1) Control view is used to specify the input and output connections. The user is allowed to load a configuration file through the use of a Load New button. At this point the operator can identify either zero or one source for each of the sixty-four targets or verify the contents of the pre-existing file and modify. Multiple targets can share the same source. To set the connections, click on a source name adjacent to the desired target name and select the source name option or select "None" for no connection to the target from the drop down menu. When the operator executes a "Load New", chooses a file, and clicks open from the NT Explorer domodal box the configuration file will open. As the file opens and the data is applied to the control view window, it is concurrently being sent to the device and displays the status of the device in the status view window. "Apply Now" will apply the connections and disconnections (if applicable) and must be clicked after every "Load New". (2) Settings views is used to specify the source and target names. These names are saved in c*:\Master\Station\MatrixGDP911IO.dat* . The left column contains the current source names and the right column shows target names. To edit a name, select it from the appropriate list control, then click on it to make the change; this edit feature is similar to the re-name convention used by Windows. Press "Enter" to complete the edit. Selection of "Apply New Names" will save the new name settings. Click "Reset Names" to restore the previously-saved names (new names will not be saved). (3) Status view is a "read-only" window which displays the current device connections.

6.0 Command Scripting

See Appendix B: Scripting Requirements

7.0 High-level Status

The Master provides access to several levels of status data for resources it monitors and controls. The Tracking Station Resources window is just one form the presentation of status data may take and it is intended to only present the very highest level status. For more detail, the user can activate and monitor high-level status windows. These windows present a high-level status summary of each unit of a particular resource type.

8.0 Replacement Algorithm

There is only one switch, therefore it cannot be replaced with a backup. If a device on the output side of a chain is signaling an error then the switch' s connection may be at fault. The Tracking Station Resources Window (TSRW) reflects status/connections prior to and during passes. If an error occurs the switch will red box displaying the switch failed. If the switch indicates a bad connection, the error condition will be brought to the attention of the operator who will have to replace a circuit card.

Future requirement: implement the three-stage algorithm in software. If the switch indicates a bad connection then use the three-stage algorithm to reroute the input to the output through the central stage.

Appendix A: Graphical User Interface Requirements

There is no additional information.

Appendix B: Scripting Requirements

Master	Node	Comments/Error Handling

Resource Request Specific Parameter: unit number	Start
	Check allocation table for unit number
	If available then
	Mark unit as assigned to this Master
	Reply "Unit # assigned"
	Open log file
	Retrieve configuration file from this Master
	Else
	Reply "Unit # not available"
	End
	Stop
		There is only one GDP 911 Digital Matrix Switch. Therefore, the request will always be for the same switch. Even though there is only one switch, scripting methodology is followed to ensure uniformity in the method of interaction used by Master and Node software with devices.

Resource Request General	Start
	Check allocation table for an available unit using the least recently used method
	If available then
	Mark unit as assigned to this Master
	Reply "Unit # assigned"
	Open log file
	Retrieve configuration file from this Master
	Else
	Reply "No units available"
	End
	Stop	

Setup Parameter: unit number	Start Verify possession of unit by this Master	

Master	Node	Comments/Error Handling

	If not assigned to this Master then
	Inform this Master
	Stop
	End
	Load and Verify configuration file
	If configuration file error then
	Inform this Master
	Stop
	End
	Stop
		>> Operator intervention required
		
		>> Operator intervention required

Start Support Parameter: unit number	Start Verify possession of unit by this Master If not assigned to this Master then Inform this Master Stop End Stop	>> Operator intervention required
Stop Support Parameter: unit number	Start Verify possession of unit by this Master If not assigned to this Master then Inform this Master Stop End Stop	>> Operator intervention required
Takedown Parameter: unit number	Start Verify possession of unit by this Master	

Master	Node	Comments/Error Handling
	If not assigned to this Master then Inform this Master Stop End Mark unit as not assigned Close log file Send log file to this Master Stop	>> Operator intervention required